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# THE AGRICULTURAL SITUATION

NOVEMBER 1940

*A Brief Summary of Economic Conditions*

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FARMERS bring to a close another year of abundant production. Prices are averaging a little higher than at the outbreak of the European War, cash farm income for 1940—estimated at approximately 9 billion dollars—is the second largest since 1929. \* \* \* Domestic demand for farm products continues good, and is expected to increase in 1941. In best position are farmers producing chiefly for the domestic market. Exports continue to decline as continental European markets have been cut off by war blockades. United States exports of farm products will continue to be small through 1941. \* \* \* Plans for 1941 farm production are now being made, with prospects that the output of agricultural products will be about the same as in 1940. Favorable price and income outlook for 1941 is contingent upon maintenance of current agricultural adjustments by farmers in order to obtain maximum benefits from increased domestic demand. Supplies of food, feed, and fibers are fully adequate for current needs plus carry-overs.

# Commodity Reviews

## DOMESTIC DEMAND: Good

**P**URCHASING power of consumers in the United States has increased materially since last spring, and is now somewhat greater than during the business boomlet which followed the outbreak of European War in September a year ago. Industrial activity now is about 15 percent above the April low. Income of industrial workers is up about 10 percent, although only about 1 percent above income in the autumn of 1939.

Industrial output has reached such a high level that further gains will be much more difficult of attainment. Steel output already is near capacity, and some other important industries are operating around the highest levels in their history. For some of these industries capacity is being increased, but this is a relatively slow process. Industrial activity, therefore, may be expected to fluctuate for some time about present levels.

The general business prospect for the next few years continues to favor a relatively high level of consumer purchasing power and demand for farm products.—F. L. THOMSEN.

## EXPORT DEMAND: Poor

Exports of farm products continue to decrease. Losses to continental Europe have been especially severe, due to the British blockade. The United Kingdom continues to take a larger volume of United States farm products than any other country, but much smaller than before the European War. Canada now is the second best export market, and is taking more agricultural products than in 1939.

Important products unfavorably affected by the export situation include cotton, tobacco, wheat, pork products, fruits, soybeans, and feed-stuffs. Dairy products and dried

beans are in a relatively favorable position but do not bulk large in total volume of exports. So long as the European War continues, total exports of farm products are not likely to show any substantial improvement.—P. H. BOLLINGER.

## PRODUCTION: Increased

October crop report increased 1940 production estimates for corn, wheat, oats, grain sorghums, hay, peanuts, potatoes, tobacco, sugar beets, apples, pecans; reduced estimates for rice, beans, soybeans. Crop Reporting Board said: "Though the acreage of field and vegetable crops harvested is expected to be about 7 percent less than the average prior to recent droughts . . . yields per acre are expected to be higher than in any past year except 1937. Aggregate crop production is expected to be about 5.6 percent above the pre-drought average . . . and 1.6 percent above production last year."

Production of feed grains this season was reported "large enough to feed livestock on hand at a normal rate per head without drawing on reserves . . . Production of the principal food crops in 1940 appears to be quite generally above average. Most are above average in proportion to population . . . The fruit crop is big, even on a per capita basis, and, with exports restricted, the supply available for domestic consumption will be large . . . Commercial apple production is 5 percent below average . . . Citrus production may be the largest on record."

## PRICES: Up

A 2-point rise in the average of prices of farm products during the past month raised the Government index to 99. The 5 years 1910-14 equals 100.

Index in October last year was 97. Highest for this year to date was 101 last February. Average of prices declined to 95 in June—low point for the year—then advanced. BAE looks for further advance this winter through 1941, due to improved consumer buying power.

A number of farm products have been selling higher this fall than last.

### Index Numbers of Prices Received and Paid by Farmers

[1910-14=100]

Year and month	Prices received	Prices paid	Buying power of farm products <sup>1</sup>
1939			
October.....	97	122	80
November.....	97	122	80
December.....	96	122	79
1940			
January.....	99	122	81
February.....	101	122	83
March.....	97	123	79
April.....	98	123	80
May.....	98	123	80
June.....	95	123	77
July.....	95	122	78
August.....	96	122	79
September.....	97	122	80
October.....	99	122	81

<sup>1</sup> Ratio of prices received to prices paid.

### Prices of Farm Products

Estimates of average prices received by farmers at local farm markets based on reports to the Agriculture Marketing Service. Average of reports covering the United States weighted according to relative importance of district and States.

Product	5-year average, August 1909-July 1914	October 1909-13	October 1939	September 1940	October 1940	Parity price October 1940
Cotton, lb.....	12.4	12.1	8.73	9.23	9.35	15.75
Corn, bu.....	64.2	64.8	47.6	61.9	59.4	81.5
Wheat, bu.....	88.4	88.1	70.3	62.6	68.2	112.3
Hay, ton.....	11.87	11.49	7.31	6.98	6.99	15.07
Potatoes, bu.....	69.7	65.0	66.4	59.5	52.0	<sup>4</sup> 86.5
Oats, bu.....	39.9	38.4	30.3	27.0	28.3	50.7
Soybeans, bu. <sup>5</sup> .....	( <sup>1</sup> )	( <sup>1</sup> )	.73	.69	.67	<sup>4</sup> 1.73
Peanuts, lb.....	4.8	4.6	3.36	3.38	3.26	6.10
Apples, bu.....	.96	.72	3.58	.76	.72	1.22
Beef cattle, cwt.....	5.21	5.09	6.97	7.49	7.50	6.62
Hogs, cwt.....	7.22	7.37	6.52	6.14	5.83	9.17
Chickens, lb.....	11.4	11.5	12.7	13.7	13.3	14.5
Eggs, doz.....	21.5	23.8	22.9	21.0	23.7	<sup>2</sup> 33.9
Butterfat, lb.....	26.3	26.8	26.9	27.1	28.8	<sup>2</sup> 33.7
Wool, lb.....	18.3	18.5	28.7	28.0	29.9	23.2
Veal calves, cwt.....	6.75	6.80	8.88	9.06	9.11	8.57
Lambs, cwt.....	5.87	5.35	7.60	7.59	7.64	7.45
Horses, each.....	136.60	134.50	78.60	72.60	71.00	173.50

<sup>1</sup> Prices not available. <sup>2</sup> Adjusted for seasonality. <sup>3</sup> Revised. <sup>4</sup> Post-war base. <sup>5</sup> Soybeans for seed.

These are shown in the accompanying table. Outstanding has been the high level of prices of beef cattle, with fed steers selling for best prices in 3 years. Significant gains were recorded for wheat, dairy products, citrus fruits, and wool. Prices of practically all farm products except hogs and chickens averaged higher in the first 10 months of this year compared with last.

### INCOME: Increase

Farm cash income is declining seasonally, but the total compares favorably with 1939 figures. Total from marketings and Government payments during the first 9 months of this year was 6,175 million dollars, compared with 5,791 million in the like period of 1939. Income in the last quarter of the year may be slightly larger than in the fourth quarter of 1939. Total for the full year is tentatively estimated at 9.0 billion dollars, compared with 8.5 billion in 1939.

Most of the increase in the first 9 months of this year compared with last was in larger returns from grains, dairy products, and meat animals. The only major group of commodities



showing a decline was cotton and cottonseed, but much of this was due to delayed marketings in September. Increases from cotton and cottonseed in October and November are expected to raise the total for these commodities above the 1939 figures.

The following table gives totals for the last month of record, and cumulative figures for the first 9 months, with comparisons:

Month and year	Income from marketings	Income from Government payments	Total
	<i>Million dollars</i>	<i>Million dollars</i>	<i>Million dollars</i>
September:			
1940-----	839	55	894
1939-----	835	66	901
1938-----	769	27	796
1937-----	940	5	945
January-September:			
1940-----	5,633	542	6,175
1939-----	5,233	558	5,791
1938-----	5,273	333	5,606
1937-----	6,106	351	6,457

## WHEAT: Supply

Domestic and world wheat-supply estimates were revised only slightly in October, large quantities of wheat continued to go into United States Government loan holdings, and domestic prices continued to advance independently of prices in other countries. Wheat supplies in the United States were estimated at 1,076 million bushels for the year beginning July 1940, or 69 million bushels more than in the preceding year. Domestic disappearance including exports may total little more than 700 million bushels, leaving about 375 million for carry-over on July 1 next.

BAE says that large world wheat supplies and low export prices will continue during the 1941-42 season, unless world acreage is materially smaller than is now expected, or world yields per acre are small. Wheat prices in the United States, however, are expected to remain independent, to a considerable extent, of prices in other countries. Indications are that

the acreage seeded to wheat for harvest in 1941 in the United States will be about the same as in 1940. Prices advanced in October due to the limited supply of wheat in commercial channels.

## COTTON: Consumption

Prospects continue that United States mill consumption of cotton will set a new high record during the current season. Total is expected to materially exceed 8 million bales under the stimulus of large United States Government purchases of cotton textiles and the prospective high level of industrial production and increased employment and pay-rolls. But reduced consumption in foreign countries will more than offset the increase in the United States. Exports from the United States this season likely will be between 1 million and 2 million bales.

World consumption of American and foreign cotton may be the smallest since the early 1930's. World carry-over on August 1 next is likely to be the largest on record—23 million bales or more. The 1941 world carry-over of American cotton may approach or even exceed the 1939 peak of more than 14 million bales. All but about 1 million bales or less of the American cotton carried over is likely to be in the United States and most of it owned or held as collateral by the United States Government.

Cotton prices in the United States in late October were slightly higher than in October last year, supported by Government loans.

## FEED GRAINS: Record

Supply of feed grains per animal on farms is the largest on record. Total supply of corn—1940 crop plus carry-over on October 1—is 3,053 million bushels, compared with 3,202 million in 1939. Other feed grains are in larger supply this year than last. Total supply of all feed grains is smaller, but there are fewer grain-consuming animals on farms. Feed

prices are being supported by the Government corn loan program.

BAE says that prices of feed grains may continue high relative to livestock prices during most of 1941, but that the relationship may tend to become more favorable to livestock feeders as the year advances. The carry-over of corn next October 1 will probably be near the record carry-over of this year. Exports of feed grains during 1940-41 will be practically nil.

### CATTLE: On Feed

Estimates of numbers of cattle on feed were increased in October. The number fed for market during the winter and spring of 1940-41 may be about the same as a year earlier. Shipments of stocker and feeder cattle into the Corn Belt States west of the Mississippi River from July through September were larger than a year earlier, while shipments into the Eastern Corn Belt were smaller. Some decrease in cattle feeding is expected in the Rocky Mountain States this year, but an increase in Texas and Oklahoma.

Market records indicate that shipments of feeder cattle to the Corn Belt in recent months consisted of a larger proportion of light weight feeders than a year earlier. This may result in smaller marketings of grain-fed cattle in the first half of 1941 than in the first half of 1940. BAE says that in this event, the seasonal decline in prices of grain fed cattle this winter and next spring may be less than usual; adds that in view of prospective substantial improvement in consumer demand for meats, the general level of cattle prices in 1941 is expected to be higher than in 1940. .

### HOGS: Production

The pig crop (spring and fall combined) was about 10 percent smaller this year than last. Ratio of hog prices to corn prices is a little higher than at this time last year, but probably will continue unfavorable for hog

producers. This suggests a moderate reduction in the 1941 spring pig crop. Hog production probably will not increase before the last half of 1941. Marketings during the 1941-42 season may not be much different than during 1940-41.

Slaughter supplies of hogs in the 1940-41 hog marketing year which began on October 1 will be substantially smaller than the large supply marketed in 1939-40. The number of hogs slaughtered under Federal inspection during this period is expected to total about 43 million head. This would be a decrease of about 10 percent from the 47.6 million slaughtered in 1939-40. Except for last year, however, the slaughter will be the largest since 1933-34.

BAE looks for a "materially higher" level of hog prices in 1940-41 compared with 1939-40. This is based upon prospects for a substantial reduction in hog supplies, and further improvement in domestic consumer demand for meats. A seasonal decline in prices is expected this fall and winter as marketings increase, but not to the low levels of last winter. No improvement in export demand for pork and lard is expected this season.

### LAMBS: Supply

Slaughter supplies of sheep and lambs will be about the same during the fed-lamb marketing season—December through April—this year as last. But prices are expected to average higher on account of a stronger consumer demand for meats and higher prices for wool and pelts. AMS reported in October that shipments of feeder lambs and sheep into the Corn Belt States from July through September had been about as large as the unusually heavy shipments during the like period last year.

Reports indicated heavy feeding in the Western States this season, a decrease in the Rocky Mountain States, an increase in the area west of the Continental Divide, and "con-

siderable increases" in Texas and Oklahoma. Wheat pastures in Kansas, Oklahoma, and eastern Colorado were reported as having made excellent growth this fall, and a heavy movement of lambs from Texas and other western sheep States was expected.

### WOOL: Consumption Up

Strengthening influence on domestic wool prices is the relatively high level of mill consumption. Supply of wool in all positions in the United States on September 1 was about 450 million pounds, grease basis. Supply was larger than at same time last year, but small in relation to probable domestic consumption during the next few months. Imports probably will be larger this fall and winter than last.

Apparel wool import requirements in current season may be chiefly for the finer grades, due to large use of such grades in materials for Army use. Australia and South Africa are leading fine wool-producing countries, although a considerable quantity of fine wool is available in South America. South American wool markets opened in late September.

The quantities of Australian and South African wool released for export and the prices fixed for such wools by the British Government will be important factors affecting prices of fine wools in this country in the next few months. BAE says it seems probable that considerable quantities of Australian and South African wool will be available for export to the United States.

### FATS, OILS: Low Priced

Practically all fats and oils except butter are selling lower than at this time last year. This situation reflects the record large output of tallow, greases, and soybean oil this year, the large supplies of lard available for domestic consumption as the result of the loss of export markets, and the existence of large supplies of low-priced vegetable oils in the Philippines,

Netherlands East Indies, and other surplus-producing areas cut off from European markets.

Domestic crushings of soybeans in the 1940-41 season will be about 5 percent larger than in 1939-40, even though production of soybeans is about 6 million bushels smaller this year than last. The increase in crushings will be due to the cutting off of exports of beans to continental Europe. About 11 million bushels of soybeans, representing 13 percent of the domestic crop, were exported last season.

BAE forecasts a stronger domestic demand for all fats and oils in 1941. Decreases in production of lard and grease are indicated, but increases in production of cottonseed oil, soybean oil, and peanut oil. Production of peanuts is the largest on record, but the effect of this upon prices will be relieved by an expansion in the Government program for diverting peanuts to crushing mills and by improved demand for peanut products.

### DAIRY: Prices Up

Prices of dairy products are rising seasonally notwithstanding unusually heavy production of milk for this time of year. Milk production has been setting new monthly high records, due to increased production per cow and the larger number of cows. Principal factor inducing higher prices is the increase in consumer buying power as industrial production expands for national defense. BAE looks for a higher average of prices of dairy products this winter than last.

BAE says that prospects are for larger production of each of the manufactured dairy products during the period October-April 1940-41 than in the like period of 1939-40, but that reduced imports of cheese and increased exports of dairy products—particularly of canned milk—will offset somewhat the effect of the larger production. This suggests that the increase in supplies available for domestic consumption will not be as great as the increase in production.



## FRUITS: Big Supply

Smaller crops of deciduous fruits and larger crops of citrus—this year compared with last—were indicated by October crop reports. The commercial crop of apples was indicated at 115 million bushels, compared with 143 million in 1939, and with 122 million average for the 10 years 1929-38. The combined production of oranges and grapefruit from July to June 1940-41 was estimated at 4,941 thousand tons, or 18 percent more than in 1939-40.

Domestic consumption of fruits is larger this season than last, but not large enough to offset the loss of export markets. Government has instituted programs for handling the surplus.

\* \* \* Citrus production continues to increase as more trees come into bearing, and the commercial production of apples has not been affected much by the removal of trees in home orchards. Probabilities are that total production of fruit will be larger next year.

## TRUCK CROPS: Increase

October reports indicated a 5-percent increase in acreage planted or to be planted to 10 truck crops for fall and winter harvest this season compared with last. The increase over the 1930-39 average is about 25 percent. Increases were indicated for new crop snap beans, cabbage, carrots, cauliflower, kale, and spinach; decreases for artichokes, celery, and peppers. Total acreage of asparagus indicated to be available for all purposes in 1941 is about 1 percent larger than that harvested in 1940, and 19 percent larger than the 1930-39 average.

Total plantings of truck crops probably will be increased slightly in 1941 compared with 1940. Increases are most likely in important truck crops except lima beans, cabbage, cauliflower, celery, and watermelons. Because of the relatively high prices received in 1940 for many of the early truck crops, it is likely

that the acreage of many of these will be increased substantially. BAE looks for an advance in the general level of truck crop prices next year.

## POTATOES: Increase

Production estimates on late potatoes were increased to 305 million bushels in October, compared with 290 million harvested in the 30 late States last year, and with 296 million average for 1929-38. Market prices were substantially lower than in 1939, but are improving now. Potato acreage probably will be increased next year, but the total crop would be smaller than in 1940 if yields average the same as in the last 4 years.

A slight increase in plantings of sweetpotatoes also is in prospect for 1941. The 1940 crop was the smallest since 1936. (Ordinarily the sweetpotato acreage in the South varies inversely with the price of cotton of the previous season, and in the commercial areas directly with the price of sweetpotatoes of the previous season. Acreage in the South next year will be about the same as in 1940, but in the commercial areas an increase is suggested by the higher level of prices this season.)

## TURKEYS: Record Supply

BAE sums up the turkey situation, says that supplies of turkey meat may be slightly larger this fall and winter than last. There was an increase of 1 percent in the number of turkeys raised this year, a slightly heavier average weight per bird, and a larger storage stock at the beginning of this season. But the effect of these larger supplies on prices may be partly offset by the effects of larger consumer incomes and smaller supplies of chicken and pork.

An additional favorable factor is that consumers now eat turkey practically the year around. Between February 1 and October 1 about 50 million pounds of turkey moved out of storage into consumption, as compared

with only 18 million pounds in 1939. The average price per pound received by farmers for the major part of the 1940 crop of turkeys is expected to be about the same as or somewhat lower than the average received for most of the 1939 production. Turkey prices in early 1941 may be higher than a year earlier.

### CRANBERRIES: Less

The 1940 crop of cranberries was placed at 571,300 barrels in October reports, compared with 704,100 barrels in 1939, with 580,390 barrels average for the 10 years 1929-38. The Massachusetts crop is nearly one-third smaller than in 1939, and well below average. Berries were reported as running small to medium in size but of good keeping quality. Production in Wisconsin is larger this year than last; the figures for Washington and Oregon are larger;

in New Jersey the crop is the same as in 1939.

### NUTS: Reduction

Smaller crops of almonds, walnuts, filberts, and improved varieties of pecans were indicated by October crop reports this year compared with last. Production of improved pecans was estimated at 19 million pounds compared with 21 million in 1939; California almonds at 11 thousand tons compared with 19 thousand last year; California and Oregon walnuts at 50 thousand tons with 59 thousand last year; Oregon and Washington filberts 3.2 thousand tons with 3.7 thousand last year. Production of wild or seedling varieties of pecans was indicated at 63 million pounds, compared with 42 million last year. Prices of nuts will probably average higher this season than last.

—FRANK GEORGE

United States: Exports and Imports of Specified Agricultural Commodities, September-August 1938-39 and 1939-40, and September 1939 and 1940 <sup>1</sup>

Commodities	Unit	September-August		September	
		1938-39	1939-40	1939	1940
<i>Exports</i>					
Pork:		<i>Thousands</i>	<i>Thousands</i>	<i>Thousands</i>	<i>Thousands</i>
Cured pork <sup>1</sup> .....	Lb.....	76, 072	45, 673	4, 448	1, 162
Other pork <sup>2</sup> .....	Lb.....	46, 103	74, 827	4, 707	2, 736
Total pork.....	Lb.....	122, 175	120, 500	9, 155	3, 898
Lard, including neutral.....	Lb.....	263, 932	247, 037	24, 693	9, 956
Wheat, including flour.....	Bu.....	107, 555	44, 731	5, 675	3, 044
Apples, fresh <sup>3</sup> .....	Bu.....	12, 035	2, 920	348	77
Pears, fresh.....	Bu.....	160, 047	73, 311	14, 527	2, 618
Tobacco, leaf.....	Lb.....	447, 285	301, 548	44, 246	6, 394
Cotton, excluding linters (500 pounds).....	Bale.....	3, 527	6, 374	692	97
<i>Imports</i>					
Cattle.....	No.....	740	623	20	30
Beef, canned, incl. corned.....	Lb.....	83, 132	76, 055	13, 055	4, 016
Hides and skins <sup>4</sup> .....	Lb.....	296, 985	331, 565	24, 117	28, 012
Barley malt.....	Lb.....	108, 516	61, 279	7, 064	2, 497
Sugar, cane (2,000 pounds).....	Ton.....	2, 618	3, 238	415	200
Flaxseed.....	Bu.....	19, 164	11, 866	452	24
Tobacco, leaf.....	Lb.....	60, 681	64, 532	5, 214	5, 500
Wool, excluding free in bond for use in carpets, etc.....	Lb.....	69, 471	171, 329	11, 944	15, 357

<sup>1</sup> Corrected to Oct. 25, 1940.

<sup>2</sup> Includes bacon, hams, shoulders, and sides.

<sup>3</sup> Includes fresh, pickled or salted, and canned pork.

<sup>4</sup> Includes baskets, boxes, and barrels in terms of bushels.

<sup>5</sup> Excludes the weight of "other hides and skins" which are reported in pieces only.

Office of Foreign Agricultural Relations. Compiled from official records, Bureau of Foreign and Domestic Commerce.

# This Changing Agricultural World

## V: Fats and Oils

**P**ERHAPS the most significant development in the world fats-and-oils situation during the past 20 years has been the rapid increase in the production and consumption of vegetable oils and whale oil. Since the World War of 1914-18, the demand for fats, particularly the hard fats suitable for edible products and for soap, has expanded on a world-wide scale. Although livestock and dairy industries, which formerly supplied the major part of the world's fat requirements, have increased since 1918, the increase in this direction has not been sufficient to meet the new demands. Vegetable oil-seed and oil-nut production, and whale-oil production, on the other hand, have been capable of great expansion at relatively low cost. This expansion has been encouraged by the extension of the process for hardening and stabilizing the liquid fats, or oils, by hydrogenation.

The process for hardening fats and oils by hydrogenation, usually accomplished by passing hydrogen through the heated fat or oil in the presence of a nickel catalyst, was discovered early in the present century. But it was not until the third and fourth decades that widespread use of the process was made. At the present time, large quantities of cottonseed oil, coconut oil, soybean oil, peanut oil, whale oil, fish oils, and several other liquid or semisolid fats are hydrogenated for use in such products as cooking compounds, soap, margarine, and candles. Frequently hardened oils, because of their relatively low cost, uniform consistency, and stability, are preferred to natural solid fats, even when such fats are abundantly available.

**P**ART of the increase in world production of liquid fats during the past 20 years has been the indirect

result of efforts to expand production of other products. World production of cottonseed (excluding China), for example, was increased from less than 9,000 million short tons in 1918 to nearly 13,000 million tons in 1938, chiefly because of the increased cultivation of cotton in the Soviet Union, South America, colonial Africa, and other areas. In the main, however, the expansion in liquid-fat production has been accomplished chiefly by direct efforts to increase supplies of fats and oils.

World peanut production (again excluding China) was increased three-fold between 1918 and 1938, soybean production was nearly doubled, exports of coconut oil and copra from tropical areas were nearly tripled, large palm-tree plantations were established in the East Indies and West Africa, production of sunflower seed, rape seed, sesame seed, and poppy seed in Asia, Europe, and South America was increased considerably, and the harvest of wild babassu nuts in Brazil was expanded. Production of materials yielding industrial oils, such as castor beans, tung nuts, and perilla seed, also was materially expanded, mainly in response to increased world demand for such oils. Among the major oilseeds, only flaxseed and hempseed have failed to show gains in output.

**W**ORLD production of whale oil increased more than seven-fold in 20 years, rising from 156 million pounds in the 1918-19 whaling season to 1,137 million pounds in 1938-39. The greater part of this increase occurred after 1928. Norway and the United Kingdom lead in the output of whale oil, with large modern whaling fleets sailing each year to the Antarctic and other grounds in pursuit of the large and fast blue and fin whales, as well as humpback, sperm, and sei whales. Since 1935, Japan



and Germany also have engaged in whaling activities on a large scale, although German enterprise has lately been interrupted by the war. There have been several great whaling eras in the past, but none has equaled the present in efficiency of operations and in the quantity of whale oil produced. Formerly, whale oil was used chiefly as an illuminant and a lubricant. Now, as a result of the development of the hydrogenation process, it is used mainly in the manufacture of food products and soap.

Increased world production of vegetable oils and whale oil has made possible a marked increase in the world consumption of fats per capita. It also has resulted in some shifting of the currents of world trade. This is of special importance to the United States, since with low-cost vegetable and marine oils available, many European countries have become increasingly reluctant to buy American lard, as well as beef and mutton fats, except at low prices.

THE United States for many years has been the principal lard-exporting nation, and has had an important share in world exports of beef and mutton fats, particularly oleo oil, which, with neutral lard, formerly was an important ingredient of margarine. The trend in exports of oleo oil from the United States has been downward since 1921 and the trend in lard exports has been downward since 1923. A precipitate drop in lard exports occurred in 1934 and 1935, largely because of the curtailment in domestic hog slaughter and lard production which followed the severe drought of 1934. Domestic lard production was restored to predrought levels in late 1939 and in 1940, but exports continued at a low level. The scarcity and high price of lard in European markets in the period 1935-38 tended to speed up the process of developing substitutes for it, which, in the United Kingdom, consisted largely of hardened

whale, cottonseed, and peanut oils.

Strong European tendencies toward national self-sufficiency during the last decade and, more recently, the European War have given further impetus to the substitution of low-cost vegetable and marine oils for such fats as lard and oleo oil. During the 1920's, Germany took about a third of the total lard exports from the United States. But since 1933, Germany has sought to obtain its fat requirements from an expanded domestic output and from countries with which profitable trade bargains might be made. Under the autarchic regime, German imports of lard from the United States dwindled rapidly, and at the outset of war, in September 1939, such imports had virtually disappeared. Imports of American lard by other countries on the continent of Europe have never been large; in recent months practically no lard has been imported from the United States, except by Finland.

THE United Kingdom in the past has been the most important foreign outlet for American lard. Vegetable oils and whale oil had made some inroads on the British lard market before the outbreak of war, particularly in the period of lard shortage. But it was not until the necessity for conserving dollar exchange became acute, after the outbreak of war, that the normal consumer preference for lard as a cooking fat in the United Kingdom was subordinated to the national interest, and imported lard was, to a large extent, replaced by cooking fats manufactured from hardened whale oil and vegetable oils obtained chiefly from Empire sources. If the war in Europe is of long duration, it is possible that British taste may be permanently converted to the hydrogenated cooking fats. In that case, the export market for United States lard would be confined largely to Cuba, Mexico, and Central and South America, which probably could not be counted



on to take more than about one-fifth of the usual quantity of lard available for export in this country.

IT seems probable that the world trend toward increased vegetable-oil production will be continued in the next 10 or 20 years, although the upward tendency, outside of Europe and North America, may be halted for the duration of the present war. Large surpluses of copra, palm oil, palm kernels, flaxseed, peanuts, rape seed, and other oil-bearing materials are now "backed up" in the Philippine Islands, the East Indies, Argentina, Uruguay, West Africa, and India as a result of the blockade of the important continental European market. But when that market is reopened, it is likely that the demand for fats in Europe will be so great that the surpluses available in non-European countries will be rapidly used up. Further impetus probably will then be given to increased production of vegetable oils, particularly since the production of animal fats in Europe will be curtailed for several years as a result of the reduction of livestock now under way.

It is generally believed that world production of whale oil cannot be greatly increased beyond the level of the late 1930's without seriously depleting the whale population. Hence any marked increase in output in this field probably would be followed by a declining trend in production.

THE United States for many years has produced an export surplus of lard and other animal fats and oils, although certain vegetable oils normally are imported, mainly for the purposes of adding quick-lathering properties to soap and of supplementing domestic supplies of drying oils. The loss of lard exports in recent months has seriously depressed the price structure for domestic food and soap fats, particularly those of animal origin. Hence, the regaining of former export markets for the animal fats and

oils is important to American producers. In the face of the many world political and economic uncertainties, a forecast of the course of exports in the next few years would be extremely hazardous. But on the basis of all available indications it seems fairly safe to say that over the longer period the trend in exports of animal fats and oils from the United States is likely to continue downward. World productive capacity for vegetable fats and oils is now at a high level and promises to increase further in the future.

Europe for many years has imported livestock feeds as well as fats and oils. A considerable part of the imports of feeds has been in the form of vegetable-oil-bearing materials, which when processed for oil also yield cake and meal of a high protein content—widely used for livestock feeding, particularly for dairy cattle. Oilseed crushing mills form an important part of the industrial structure of Europe. The crushing industry has grown rapidly in importance in recent years, and since the deficit of both fats and feeds in Europe is likely to become greater as the human population increases, the importation and crushing of vegetable-oil-bearing materials probably will become even more important as time goes on.—R. M. WALSH.

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## EMPLOYMENT: Decrease

Farm employment, declining as the 1940 harvest draws to a close, will decrease more through December. Wages this fall have been about 29 percent above the 1910-14 average, as contrasted with a farm price level slightly below average. The ratio of prices received by farmers to the wages they paid hired hands was about 75 percent of pre-World War. October farm wage rates were about 3 points higher this year than last. BAE forecasts higher farm wages in 1941 compared with 1940 as industrial production and employment expand.

# Expenditures for Farm Machinery

FARM purchases of machinery and motor vehicles in the last 5 years have been about double what they were in the pre-war years 1910-14. The great increase was in the purchases of motor vehicles. Expenditures for farm machinery other than motor vehicles in the last 5 years averaged about the same as in the pre-war period. The annual purchases of automobiles increased from less than 100 million dollars to about 250 millions, motor-trucks from less than 10 million to about 45 million dollars, and tractors from an average of a little more than 10 million to about 200 million dollars.

While farm expenditures for equipment and motor vehicles were twice as great in the past 5 years as they were in the pre-war years (1910-14), the number of horses and mules on farms was reduced from 25 to 15 million head and the number of hired laborers employed was about 13 percent lower than in the pre-war years. The number of farms is about 10 percent greater, the acreage cultivated has increased, and agricultural production is materially greater than it was. Thus the increase in motor vehicles and motor power represents not only a shift from horse power but also a considerable increase in production accompanied by a decrease in the man power required on farms.

The greatest contribution of motor power has been in the direction of improving harvesting and threshing so as to deal with crops in critical periods and to make possible the handling of larger crops on farms when the harvesting time and labor are limiting factors. Comparing the censuses of 1910 and 1930, it may be observed that the crops harvested per farm in 1930 were 8 acres greater than in 1910, and the acres harvested per person were 10 greater than in 1910.

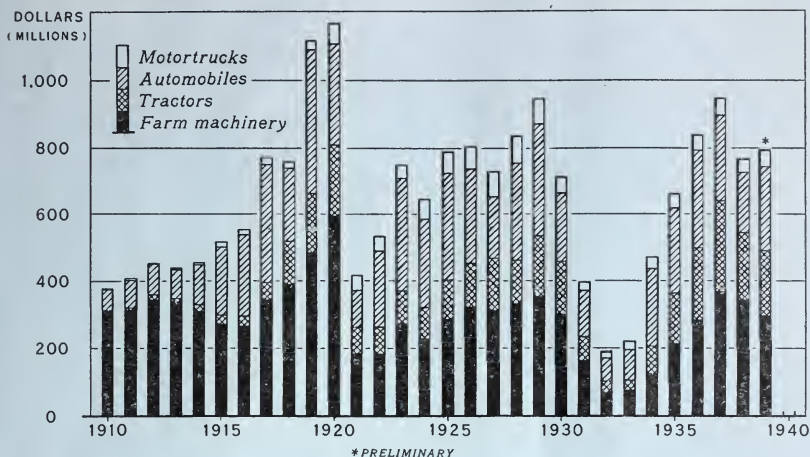
DURING most of the period since the World War the automobile has been a major item in farmers' purchases of mechanical power, with tractors second in importance. However, purchases of tractors relative to automobiles have increased steadily, and in 1937 and 1938 they exceeded purchases of automobiles. The amounts spent by farmers for motor-trucks in all years were considerably less than for automobiles or tractors and have increased much less since 1932 than the purchase of other forms of mechanical power. The increase in purchases of second-hand automobiles and trucks has been an important factor in the decreased proportion of the total outlay for machinery

Table 1.—Estimated Farmers' Purchases of Automobiles, Motortrucks, Tractors, and Other Farm Machinery, 1910-39

Year	Auto- mo- biles	Motor- trucks	Trac- tors	Other farm ma- chinery	Total
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
1910-----	61	2	6	309	378
1911-----	82	3	8	314	407
1912-----	90	4	14	346	454
1913-----	87	4	10	341	442
1914-----	120	8	20	310	458
1915-----	207	14	28	270	519
1916-----	243	16	31	267	557
1917-----	356	19	53	344	772
1918-----	222	17	130	390	759
1919-----	428	28	179	485	1,120
1920-----	301	60	212	594	1,167
1921-----	107	42	83	186	418
1922-----	225	42	80	183	530
1923-----	338	38	97	275	748
1924-----	264	61	92	229	646
1925-----	317	66	119	287	789
1926-----	281	72	129	324	806
1927-----	188	71	155	313	727
1928-----	292	79	130	332	833
1929-----	337	77	181	355	950
1930-----	204	49	158	300	711
1931-----	134	26	76	163	399
1932-----	71	16	32	69	188
1933-----	92	26	30	74	222
1934-----	230	36	83	122	471
1935-----	252	43	153	215	663
1936-----	296	44	214	284	838
1937-----	254	51	271	375	951
1938-----	180	40	201	343	764
1939 <sup>1</sup> -----	250	51	194	298	793

<sup>1</sup> Preliminary.

FARMERS' PURCHASES OF AUTOMOBILES, MOTORTRUCKS, TRACTORS,  
AND OTHER FARM MACHINERY, UNITED STATES, 1910-39



going for these items. The number of tractors on farms, however, has continued to increase and at the beginning of 1940 was 75 percent larger than in 1930, whereas the number of automobiles and motortrucks on farms was only slightly higher in 1940 than in 1930.

**T**HE marked increase in farmers' outlay for mechanical power equipment since 1910 is shown in the preceding table and chart. During the period 1910-14, farmers' yearly purchases of such equipment averaged 104 million dollars, which was only about 25 percent of the purchases of all types of machinery. In the years 1925-29, purchases of mechanical-power equipment averaged 499 million dollars and was 61 percent of total purchases of all machinery.

The estimates of purchases of the various types of farm machinery given in table 1 represent the net outlay of farmers as a group for all types of farm machinery. In the estimates of purchases of automobiles and motortrucks, allowance has been made for the trade-in value of vehicles. As tractors and other farm machinery are bought almost exclusively by farmers, only the purchases of new equipment are included in the esti-

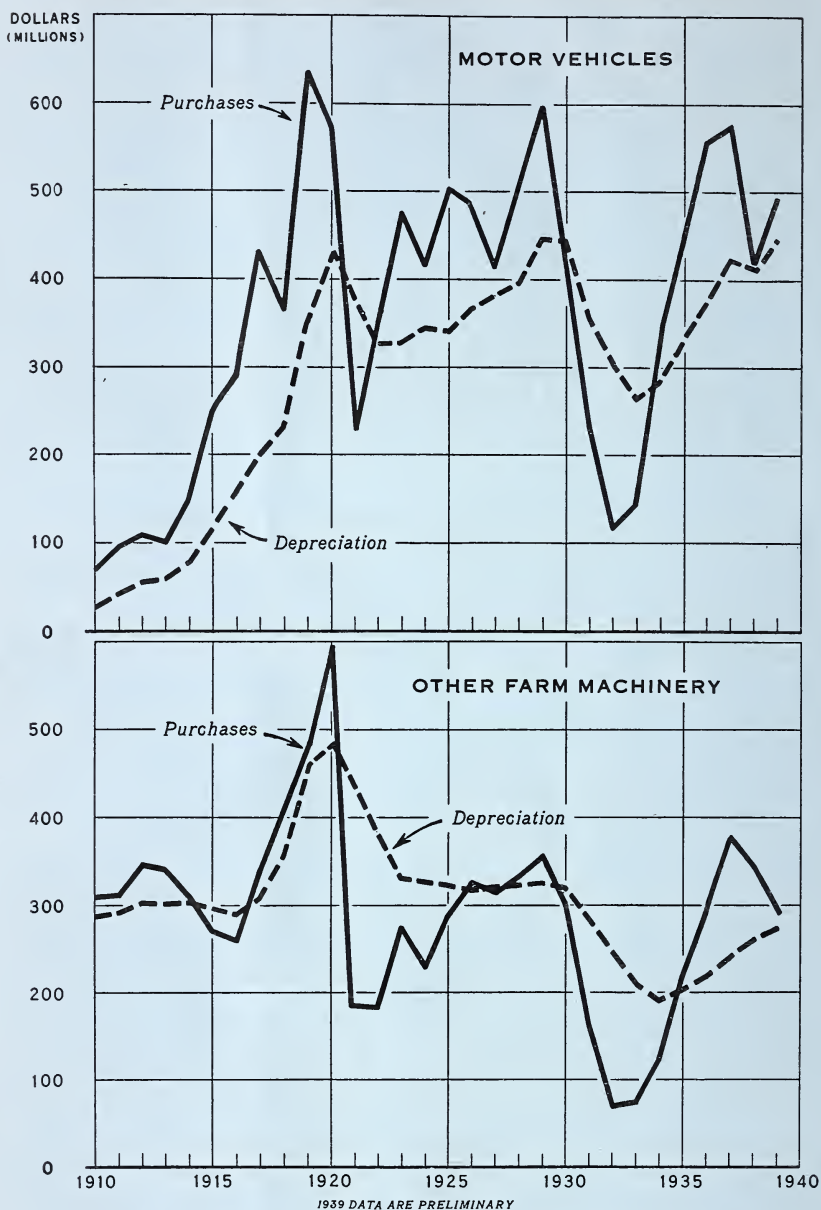
mates and no adjustment was made for trade-in allowances.

Because of the durability of most farm machines and the wide variation in purchases from year to year, depreciation is probably a better measure of the cost of machinery used in a year's production of agricultural products than the actual purchases of machinery in that year. In years when farmers' income is relatively high, purchases of farm equipment tend to exceed the amount of machinery annually used up. On the other hand, in periods of depression such as 1921-22 or 1930-33, farmers' purchases are considerably less than the machinery used up in production.

**T**HE relationship between farmers' purchases and depreciation of machinery from 1910 to 1939 is shown in the chart on page 14. During the years 1910-20, purchases were somewhat in excess of depreciation charges and farmers were adding all types of farm machinery to their existing equipment. During the period 1923-29, purchases also exceeded depreciation. This was a period when the number of automobiles, tractors, and motortrucks on farms rapidly increased. From 1930 to 1933 farmers' purchases were considerably below the estimated depre-



**FARMERS' PURCHASES AND DEPRECIATION OF MOTOR VEHICLES  
AND OTHER FARM MACHINERY, UNITED STATES, 1910-39**



ciation of farm machinery. This period was accompanied by a marked decline in the number of automobiles on farms, some decline in the number of tractors and trucks, and a marked increase in the average age of machinery on farms. Since 1933 farmers

have been replenishing the equipment that was worn out during the depression years 1930-33, and purchases have been somewhat higher than depreciation charges.

O. C. STINE,  
*Chairman, Income Committee.*



# Rubber—An American Problem

THE United States is the leading consumer of rubber, taking annually about 600,000 long tons, or more than half the annual world output. Despite this great demand, no rubber is produced domestically, and only an insignificant volume comes from the tropical Americas—original source of practically all rubber. British Malaya, Netherlands Indies, and adjacent areas, 10,000 miles away, furnish over 97 percent of the world production. More than 2 months are required for a shipment of rubber to reach the United States; there is no equally important strategic raw material that is shipped so far and in such large quantities. To the extent that the economy of the United States depends on rubber, any interference with existing sources of supply might result in the most serious consequences.

PRIOR to and during the first decade of this century, wild rubber was the only variety entering international trade, as distinguished from the cultivated rubber that took its place, which is collected from trees carefully planted and tended. World production of wild rubber reached its peak of 83,000 long tons in 1910 while the output of plantation rubber was only 11,000 tons. Since more than half the wild rubber came from Brazil, it was for many years Brazil's second-ranking export, exceeded only by coffee; as a source of government revenue rubber outranked even that commodity.

The very factors that made Brazil the chief beneficiary of the rubber industry—increasing demand, limited supply, and high prices—provided a tremendous impetus for the young plantation rubber industry in the Far East and eventually resulted in the replacement of wild rubber. It is significant that the plantation rubber

industry was developed from the seeds of the wild *Hevea Brasiliensis* tree of Brazil. By 1914 plantation rubber production exceeded the production of wild rubber. Shortly thereafter, wild rubber sources became unimportant. In 1939 the world's exports of rubber were estimated at 1,000,000 long tons. Brazil's share was not more than 17,000 tons, or 1.7 percent of the total; all wild rubber sources contributed only 28,000 tons, or 2.8 percent of the total export volume; plantation rubber of the Far East accounted for 97 percent.

AT the time when wild rubber was being rapidly displaced by plantation rubber the modern motor era arrived, and with it the mass production of rubber tires. Under the circumstances it was natural for United States rubber manufacturers to turn for their supplies to British Malaya, the Netherlands Indies, and some of the minor rubber-growing regions of Asia. The first two places are the principal sources of our supplies, accounting for approximately 85 to 90 percent of all rubber imports. The former is by far our most important source. Of the 499,000 tons of rubber imported into the United States in 1939, 278,000 tons, or 56 percent, came from British Malaya—nearly twice the volume (143,000 tons) from the Netherlands Indies.

Despite the continued predominance of Malayan rubber in United States imports, during the past two decades the United States has come to rely on the Netherlands Indies for an increasing volume of its rubber supply. In 1939 imports from the Netherlands Indies made up 29 percent of total American rubber imports, compared with only 13 percent in 1920. In years of high prices, such as 1925, when rubber averaged 48 cents per pound, the United States rubber bill totaled

431 million dollars; in the 5 years 1935-39 rubber averaged 15 cents per pound, and the average annual bill was 167 million dollars.

**I**N view of the great dependence of the United States upon rubber imported from British Malaya and the Netherlands Indies, the question arises as to the possibility of obtaining this strategic raw material elsewhere should the necessity arise. It would be relatively easy to replace at least part of the rubber shipments from the Netherlands Indies by shipment from British Malaya. An entirely different situation would result if it became necessary to replace exports from British Malaya. Such a possibility cannot be disregarded.

At present a number of measures, falling into two categories, are being adopted to meet this threat: Those dealing with an adequate supply of rubber for the present and immediate future, and those concerned with the problem of achieving ultimate independence of the Far Eastern markets. Increased purchases of crude rubber and rubber reclamation belong in the first group.

With stocks on hand totaling about 243,000 long tons (as of the end of September) and volume of rubber afloat estimated at 137,000 tons, the United States has enough rubber for more than 6 months, even if no more were imported. A small part of these stocks is included in the strategic material stocks being built up by the 87,000 tons received in barter for cotton and the 330,000 tons contracted for by the Rubber Reserve Co. organized by the Reconstruction Finance Corporation, to be delivered during the remainder of this year and during 1941. In 1939 the consumption of reclaimed rubber in this country totaled 170,000 tons or 29 percent of the crude rubber utilized in the United States. It is estimated the percentage of reclaimed to crude rubber can be considerably increased. If at the same time utilization of

rubber could be cut down in a number of nonessential products, the country's present reserves would be increased. On the whole, the period of availability of these various stocks could be materially lengthened by restrictions in use and production of rubber goods.

**T**HESE measures offer no permanent solution of the United States rubber problem. In order to bring that about the main reliance is placed upon the cultivation of rubber in Tropical America and upon synthetic rubber production in the United States.

Synthetic rubber provides a possible source of supply to be considered in an extremity such as a blockade, but because of higher price and different characteristics its utilization is not likely to be as widespread as that of natural rubber for some time to come. Synthetic rubber resistant to heat, oil, acids, and sunlight has been produced and where these qualities are important the product commands a premium price. Rubber-like materials have been derived from a great variety of materials, such as natural gas, oil, coal, sugar, potatoes and grain, all of which are produced in abundance in the United States. The first three elements, unlike natural latex are not annually renewable but must be mined and thus tend to deplete the nation's resources to the extent that they are used. In 1939 only 1,700 tons of synthetic rubber were produced in this country, or one-fourth of 1 percent of the year's consumption. In an emergency large quantities of synthetic rubber could be utilized to supplement natural rubber in the manufacture of tires, and this would doubtless somewhat reduce the price of the artificial product.

**U**NDER the auspices of the Department of Agriculture work is under way to stimulate plantation rubber production in Latin America for the purposes of developing assured sources of supply and to improve trade rela-

tions with Latin American countries. Research on plantation rubber production has recently been authorized by Congress with an appropriation of \$500,000 for a 3-year period. The need for sources of rubber other than the British, Netherlands, and French colonies in the Orient was recognized some years after the World War by rubber and vehicle manufacturing companies. Vulnerability in time of war was a consideration secondary to the idea of defense against control of supplies and prices. Plantations laid out by American companies in Liberia and in Central and South America have been gradually developed. With sustained attention to technical and biological problems in which the

government will now assist there is reason to expect a rapid extension of plantings in Latin America.

Plans of the Department of Agriculture contemplate the assembling of high-yielding strains of rubber trees from plantation sources in the East and by further plant collecting in the Amazon Valley. After rigid test at central experiment stations in the American tropics the superior strains will be distributed to demonstration stations maintained cooperatively by the Department and the Latin-American governments. The demonstration stations will be centered in areas known to be suitable for rubber culture and it is expected that the commercial plantations will be established as sup-

United States: Imports of Rubber from Specified Countries, 1920, 1925, and 1930-39

Year ended Dec. 31	Country of origin				Average value per pound
	Total	Netherlands Indies	British Malaya	Other countries	
Quantity:	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	
1920.....	568, 245	72, 374	348, 388	147, 483	-----
1925.....	896, 948	153, 241	517, 165	226, 542	-----
1930.....	1, 092, 285	185, 743	763, 411	143, 131	-----
1931.....	1, 124, 003	157, 656	804, 152	162, 195	-----
1932.....	928, 857	159, 023	655, 619	114, 215	-----
1933.....	938, 340	168, 652	682, 378	87, 310	-----
1934.....	1, 037, 160	158, 356	786, 145	92, 659	-----
1935.....	1, 046, 408	174, 842	774, 382	97, 184	-----
1936.....	1, 093, 446	215, 228	761, 129	117, 089	-----
1937.....	1, 345, 067	343, 174	823, 411	178, 482	-----
1938.....	923, 086	246, 132	547, 934	129, 020	-----
1939.....	1, 118, 595	320, 366	622, 863	175, 366	-----
Percentage of total quantity:	Percent	Percent	Percent	Percent	-----
1920.....	100.0	12.7	61.3	26.0	-----
1925.....	100.0	17.1	57.7	25.2	-----
1930.....	100.0	17.0	69.9	13.1	-----
1931.....	100.0	14.0	71.5	14.5	-----
1932.....	100.0	17.1	70.6	12.3	-----
1933.....	100.0	18.0	72.7	9.3	-----
1934.....	100.0	15.3	75.8	8.9	-----
1935.....	100.0	16.7	74.0	9.3	-----
1936.....	100.0	19.7	69.6	10.7	-----
1937.....	100.0	25.5	61.2	13.3	-----
1938.....	100.0	26.7	59.4	13.9	-----
1939.....	100.0	28.6	55.7	15.7	-----
Value:	Dollars	Dollars	Dollars	Dollars	Cents
1920.....	243, 142	31, 148	153, 758	58, 236	42.8
1925.....	431, 508	65, 639	244, 647	121, 222	48.1
1930.....	140, 989	26, 317	97, 243	17, 429	12.9
1931.....	73, 803	11, 142	51, 921	10, 740	6.6
1932.....	32, 538	5, 813	22, 214	4, 511	3.5
1933.....	45, 863	8, 546	32, 866	4, 456	4.9
1934.....	101, 648	17, 438	74, 571	9, 639	9.8
1935.....	119, 169	20, 668	87, 593	10, 908	11.4
1936.....	159, 019	31, 992	110, 524	16, 503	14.5
1937.....	248, 267	64, 709	150, 584	32, 974	18.5
1938.....	130, 171	35, 699	75, 503	18, 969	14.1
1939.....	178, 415	52, 125	98, 614	27, 676	15.9

Compiled from official records of the Bureau of Foreign and Domestic Commerce and Foreign Commerce and Navigation of the United States.



plies of the improved plants are made available. It is accepted that the keystone of a self-sustaining industry capable of competition with the Orient is high-yielding disease-resistant plant material. The expectation is that with the development of such material a considerable part of the rubber industry would return to its original home in the New World.

NEITHER synthetic nor natural rubber industries can spring full-blown to meet emergencies. In both cases enormous effort intelligently directed and large investment of capital are required. Three years for industrial plant building and 10 for growth of plantations is a fair esti-

mate of the time required to supply any considerable portion of our needs from artificial and natural sources. Experts say that exclusive use of one or the other, considering their different properties, is neither essential nor desirable. In the same product—tires for example—both synthetic and natural rubber can be used to advantage. If America looks elsewhere than to present rubber sources, the prospect for the next decade is that rubber from a test tube and temporarily high-priced tires will be followed by return to the natural source in America and with it, abatement of premium prices.

W. LADEJINSKY,  
*Office of Foreign  
Agricultural Relations.*

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## New Trends in Milk Distribution

THE cost of getting milk from the producer to the consumer is fast becoming a focal point of Nation-wide attention. Dairy farmers are producing increasing quantities of milk meeting the standards set up by the health authorities in their fluid markets. At the same time many consumers are unable to buy the quantities of milk they need primarily because they cannot afford the expenditure that would be necessary at retail prices prevailing in most markets.

In general, more than 50 percent of the retail price goes to pay for services rendered by handlers after the milk is received from the producer. Assuming that the level of producer prices is in line with what is necessary to assure an adequate supply of fluid milk, then it becomes obvious that if retail prices are to be reduced distribution costs will have to be cut.

LOWERING retail prices by cutting distribution costs appears to be one of the main keys to increased fluid milk consumption. There is a definite tendency throughout the country today for milk dealers to experiment with new delivery methods, with new

types of container, and with new pricing plans, and all of these experiments are pointed toward reducing consumer prices.

Information assembled from a number of fluid-milk markets throughout the United States indicates that where consumers have been given the opportunity of buying milk at lower prices, they buy more milk. In cities where there is a wide differential between the store price of milk and the home-delivered price, consumers buy a much greater proportion of their milk supplies from the stores. Competition in the sale and distribution of milk has led individual distributors to develop various plans for reducing prices to milk consumers in order to increase their volume of business.

MILK distributors in various sections of the country have recently turned to the use of paper or fiber containers instead of glass bottles with the idea of decreasing distribution costs. Handlers have generally confined the sale of milk in paper one-quart containers to sales through stores. The stores in the main have sold this milk for the same price as milk



in quart glass bottles, except where State milk-control boards have required a charge of 1 to 2 cents per quart more for milk in the paper container.

Whether savings in cost can be made by handlers through the use of quart paper containers is a controversial question. Studies published by paper-container manufacturers show the cost of packaging and delivering milk in paper to be less than the cost of packaging and delivering milk in glass bottles. However, other studies by glass-container manufacturers show that it costs 1 cent per quart more to package and deliver milk in paper containers than in glass bottles.

It is difficult to determine, on the basis of these studies, whether the use of paper or glass containers is more economical. Probably the best guide is the operating experience of milk distributors in individual markets. Where milk has been sold at the same price per quart, both in paper containers and in glass bottles without deposit charges, it seems that consumers prefer bottled milk. However, if, as has been asserted, the use of paper containers does reduce the cost of packaging and delivery, and if the decrease in cost is passed on to the consumer in a lower price, consumers are likely to prefer the paper container.

SOME indication of consumer preference for milk in containers which make possible lower prices is found in markets where two-quart paper and glass containers are in use. The two-quart paper container introduced last November in New York City for home-delivered milk has proved popular. One reason for its popularity apparently is in the price—3 cents less than the price of 2 quarts of milk in glass bottles. A few other markets regularly use multiple-quart glass bottles, some since 1936. The reduction in the price of milk in the paper container in New York City is about in line with reductions in other markets for milk in 2-quart and gallon glass containers.

One reason for the development of this recent trend in the use of oversize containers is without doubt the savings in the cost to consumers buying milk in the larger containers. Milk in half-gallon containers costs consumers anywhere from 1 cent less per quart in Kansas City to 3.5 cents less per quart in San Diego than milk in quart bottles. Savings to consumers on milk in gallon containers range from 1 cent per quart in Omaha to 3 cents per quart in Chicago.

In Denver, where consumers save from 1 cent to 2.5 cents per quart by buying milk in one-half gallon containers and from 1.5 cents to 2.5 cents per quart by buying milk in gallon containers, there has been a shift in quantities of milk taken in the various sized containers. A comparison of sales for the first half of January 1940 with those for the first half of May 1940 shows that while single quart sales decreased, sales in one-half gallon containers increased, bringing a net increase of nearly 4 percent in the usual consumption of milk for a 2-week period. Whether such gains in sales are typical of all markets is difficult to say, but in markets where the multiple-quart bottles have been introduced at lower prices per quart, sales of fluid milk apparently have increased.

SOME handlers have preferred to adopt other means of reducing prices to consumers. One plan that has been tried successfully in several markets makes available additional quarts of milk delivered at one time at a price lower than that of the first quart. This type of pricing plan has been adopted by some handlers in the New York and Chicago markets. In New York 14.5 cents is generally charged for the first quart of milk with subsequent quarts being sold at 11.5 cents. In the Chicago market handlers usually charge 13 cents for the first quart and 8.5 cents for additional quarts taken on the same delivery.

This plan is not greatly different from the system of quantity discounts given in some markets for many years, except that it brings savings to customers buying as little as 2 quarts at one delivery. Ordinarily, quantity discounts are given to customers buying 4 quarts or more at one delivery. For example, in the Omaha and LaPorte markets, customers buying 4 or more quarts pay 1 cent per quart less for their milk. In the Battle Creek market, four-quart customers pay the wholesale price for milk which is 2 cents per quart less than the retail delivery price. In the Kalamazoo market, however, customers buying 3 quarts at one delivery are given a price reduction of 1 cent per quart, and if they buy 6 or 7 quarts at one delivery, they pay 2 cents per quart less than the regular delivery price.

**T**HESE various plans for reducing prices of milk to consumers have placed emphasis on the purchasing of larger quantities of milk at one time. This has had two principal effects which are of primary importance to the dairy industry. The first is the increase in the consumption of fluid milk, and the second is the gradual appearance of every-other-day deliveries. The increased consumption of fluid milk improves the producers' blend, or net, price. The adoption of every-other-day deliveries reduces the cost of distribution to a certain extent, and this is one place where further economies may be expected. Although every-other-day deliveries have not been formally adopted in any market or in any geographic section of a market, reports indicate that they are gradually becoming more and more important.

Within the past few years there has been a marked improvement in the refrigerator facilities of city families and the use of mechanical refrigeration is now widespread. Because of this and the quality of milk being sold, it is no longer necessary for consumers to buy milk every day. It is now

possible to keep milk in a household refrigerator for 2 or 3 days or longer without any deterioration in quality. This is one reason why consumers shift to less frequent but larger purchases where an inducement in the form of a lower price is offered.

**A**N important development for the near future may be the adoption of every-other-day deliveries for whole retail systems. Such a plan would presumably make possible further savings in the cost of distributing milk. If one delivery wagon and driver could serve one route on one day and another route on alternate days, some savings could be made in investments for delivery equipment and for wages.

Further savings could probably be made if paper containers were adopted along with every-other-day deliveries. Paper containers for milk weigh less than glass bottles. Twice as much milk can be delivered in the same number of stops without increasing the amount of labor and time consumed in delivering and in keeping records. The use of the 2-quart paper container for this type of delivery is a convenience to the housewife because it takes up less space in the refrigerator. More milk can be kept on hand in a limited amount of refrigeration space than would be possible if it were delivered in glass bottles.

Besides the savings that could be made under a plan of every-other-day deliveries, there is the possibility of further reductions in the cost of distributing milk by consolidating delivery routes and eliminating some of the obvious duplication. It often has been pointed out that if all deliveries in any one city block could be made by one truck instead of by a half dozen or more, the mileage traveled by all trucks in making deliveries throughout the market would be substantially reduced, and consequently, the cost would be lowered. Interest in the problem of route duplication is no longer purely academic;

various groups are studying ways of dealing with it.

IN examining the recent developments in the milk distribution field, it is apparent that Government regulatory programs which establish minimum prices to producers encourage handlers to adopt more efficient methods of distributing and handling milk. The savings which handlers are able to make through reducing costs are, to a considerable extent, reflected in benefits both to consumers and to producers. On the other hand, where regulatory bodies establish both producer and consumer prices for milk,

it is observed that, in most instances, the policies followed have retarded the adoption of more efficient methods and practices in milk handling and distribution.

The cost of milk distribution is of direct concern to handlers, producers, and consumers. Increasing attention is being given to ways of lowering prices to consumers and encouraging increased consumption. All groups—producers, handlers, and consumers—will gain from these efforts.

E. W. GAUMNITZ,  
*Assistant Administrator,  
Surplus Marketing Administration.*

## The Changing Composition of Farm Income

AS a by-product of a research project entitled "The Changing Balance Between Agriculture and Industry" conducted by the Bureau of Agricultural Economics and the National Bureau of Economic Research under the Bankhead-Jones research funds, there is now available a long-time record of gross income from farm production in the United States by major commodities, as well as a record of income derived from the domestic and export markets.<sup>1</sup> This record reveals the long-time changing relative importance of the several branches of agriculture as measured by gross income from farm production of individual commodities, and the changing relative importance of the domestic and foreign markets as sources of farm income. The data brought together here may serve as background for appraising the marked changes created by the present war in the relative importance of the domestic and foreign market as sources of farm income.

The nature of changes in the relative importance of the major branches of agriculture can be seen from the fol-

lowing data for three selected 5-year periods taken around 1870, 1910, and 1934-37. In the earliest of these periods, wheat supplied about 11 percent of total gross income; in a recent period, less than 6 percent. The respective percentages for hogs are 20 and 12, for cotton and cottonseed 13 and 10. In contrast with these declines the percentage for cattle has remained relatively stable at about 9.5. In very marked contrast are the increases in relative importance of tobacco from 1.4 percent to 3.3, fruits from about 2 to 5, and dairy and poultry products from 16 to 28.

Table 1. Percentage Contribution of Selected Farm Products to Total Gross Farm Income

	1869-73	1909-13	1934-37 <sup>1</sup>
	Percent	Percent	Percent
Wheat.....	11.2	7.9	5.7
Other staple foods.....	4.8	4.5	4.3
Hogs.....	20.3	13.0	12.3
Cattle.....	9.5	9.4	9.7
Sheep and lambs.....	.5	1.1	1.2
Cotton and cottonseed..	12.6	13.4	10.4
Tobacco.....	1.4	1.7	3.3
Fruits.....	1.9	3.6	4.9
Dairy products.....	10.2	12.5	15.9
Chickens.....	2.3	3.0	4.2
Eggs.....	2.5	6.0	7.5
All other.....	22.5	22.8	10.0

<sup>1</sup> 4-year average.

<sup>1</sup> This record was published by the National Bureau of Economic Research, Bulletin 78, April 1940, under the title of "The Composition of Gross Farm Income Since the Civil War" by Frederick Strauss.



THE relative importance of the domestic market as a source of farm income has varied relatively little during the 60-year period from 1869 to 1929 on the basis of 5-year averages. In each of the 5-year periods of that interval the domestic markets contributed between 81 and 85 percent of the total gross farm income, and the export markets contributed between 15 and 19 percent; but in the more recent years the domestic markets contributed 92 percent and the foreign markets only 8. Leaving out cotton, the domestic markets contributed about 95 percent to total gross income in recent years, and the foreign markets about 5 percent.

Table 2. The Changing Relative Importance of Domestic and Foreign Demand for Farm Products

	Percent of total gross income from production derived from—		Percent of gross income from production (excluding cotton) derived from—	
	Domestic market	Foreign market	Domestic market	Foreign market
1869-73-----	83.4	16.6	91.3	8.7
1874-78-----	83.2	16.8	88.7	11.3
1879-83-----	80.7	19.3	85.9	14.1
1884-88-----	84.7	15.3	90.2	9.8
1889-93-----	82.4	17.6	88.1	11.9
1894-98-----	80.8	19.7	86.3	13.7
1899-1903-----	81.6	18.4	87.0	13.0
1904-08-----	83.3	16.7	90.1	9.9
1909-13-----	85.1	14.9	92.4	7.6
1914-18-----	82.4	17.6	86.0	14.0
1919-23-----	82.2	17.8	87.1	12.9
1924-28-----	85.3	14.7	91.3	8.7
1929-33-----	90.4	9.6	94.8	5.2
1934-37-----	91.6	8.4	95.3	4.7

THERE is a wide range of difference in the relative importance of the export market for the different farm products. In the case of cotton, the foreign market contributed two-thirds of the gross income up to the World War; in the 1920's slightly less than 60 percent; and in the recent years about 44 percent. As for tobacco, the export market contributed approximately 76 percent after the Civil War and about 40 percent during the 20 years before the World

Table 3. The Changing Relative Importance of Export Demand for Selected Farm Products

	Contribution of exports to gross income from production of—			
	Cotton	Tobacco	Wheat	Pork and pork products
1869-73-----	71.6	75.6	23.8	6.6
1874-78-----	70.2	62.4	28.1	13.0
1879-83-----	67.8	50.2	37.8	17.9
1884-88-----	67.2	50.1	29.3	12.4
1889-93-----	66.7	42.8	34.7	17.6
1894-98-----	69.2	41.6	34.3	18.8
1899-1903-----	67.3	39.8	34.5	20.9
1904-08-----	67.5	39.4	20.5	17.2
1909-13-----	67.5	41.4	18.0	13.3
1914-18-----	48.8	37.7	34.4	18.8
1919-23-----	58.4	44.0	34.9	21.1
1924-28-----	58.7	43.0	27.0	12.4
1929-33-----	56.4	38.8	15.7	6.9
1934-37-----	43.6	36.7	7.6	2.7

War. In recent years the export market has contributed approximately 37 percent.

In the case of wheat, the relative importance of the export market has varied with the cycles in domestic wheat production. The years 1880, 1900, and 1920 mark roughly the high points in the cyclical changes in wheat acreage and production. In these years wheat exports contributed around 35 to 38 percent to gross income from wheat. In the 10 years before the World War the comparable percentage was around 20, but during the 5 years 1929-33 the percentage fell to less than 16, and in the next 4-year period to less than 8.

In the case of pork and pork products, the relative importance has also varied with the changes in grain production. Around 1870 exports of pork and pork products contributed less than 7 percent to gross income from the production of hogs; around 1880, 18 percent; around 1900, 21 percent; immediately before the first World War 13 percent; around 1920, 21 percent; but in the 5-year period 1929-33, less than 7 percent; and for the period 1934-37 less than 3 percent.—L. H. BEAN.



# Outlook for Clover and Alfalfa Seed

**OUTSTANDING** factors in the outlook for clover and alfalfa seeds are: (1) Large available supplies, (2) small imports, (3) comparatively low prices. Production of most of these seeds is somewhat smaller than last year, but the carry-over is large, and total supplies are generally above those of a year earlier and much above average.

The 1940 alfalfa seed supply is estimated to be about 81 million pounds of cleaned seed, or about 6 percent larger than the 1939 supply. On September 20 the average price received by growers for alfalfa seed was about \$14 per hundred pounds, cleaned basis, compared with about \$16.50 a year earlier. Imports of alfalfa seed during the period January-June totaled 2.1 million pounds, or slightly larger than in the first 6 months of 1939. Practically no alfalfa seed has been imported during the past 2 or 3 months. Since most of our alfalfa seed imports come from Canada, imports should not be greatly curtailed by war activities.

The 1940 red clover seed crop is estimated at 93 million pounds of thresher run seed, or about 10 million pounds smaller than a year ago. The carry-over, however, is unusually large, and the total supply is estimated at about 111 million pounds of cleaned seed, or about 6 percent larger than the supply last year. The average price received by growers for red clover seed in mid-September was about \$9.40 per hundred pounds for cleaned seed, compared with \$14.40 a year ago.

**T**HE total supply of sweetclover seed for 1940 is 60 million pounds cleaned seed, compared with 71 million pounds last year. The sweetclover seed crop is about one-third less than last year as a result of reduced acreage. Yields were generally higher than those of 1939. Imports of sweet-

clover seed during recent years have amounted to as much as 10 percent of the total supply, but they have declined since early 1939, and in recent months have been negligible. The average price received by growers September 1 was \$3.50 per 100 pounds, compared with \$3.80 per 100 pounds last year.

The total supply of alsike-clover seed is estimated to be 24 million pounds cleaned seed, compared with 19 million pounds last year. Production of alsike-clover seed is estimated to be 38 percent larger than in 1939, due both to larger acreage harvested and higher yields. In early September the average price to growers was \$9.90 per hundred pounds as compared with about \$14.45 per hundred on the corresponding date last year.

The crimson clover supply is slightly larger than a year ago and the white-clover seed supply is much smaller. The price of crimson-clover seed was \$8.90 per 100 pounds in early September, or a little higher than last year. The price of white-clover seed averaged around \$45.00 per hundred pounds early in September, which is about \$15 higher than a year ago.

Imports of practically all clover seeds have fallen off substantially during the past year as a result of the war. Since in recent years the bulk of clover seeds imported came from European countries, it appears probable that imports will continue well below average for the duration of the war.

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The supply of southern rice is about the same this year as last, the supply of Californian is slightly larger. Domestic consumption may increase during the coming year, but not enough to reduce total stocks to average proportions.

# Economic Trends Affecting Agriculture

Year and month	Industrial production (1935-39=100) <sup>1</sup>	Income of industrial workers (1924-29=100) <sup>2</sup>	Cost of living (1924-29=100) <sup>3</sup>	(1910-14=100)					Taxes <sup>6</sup>
				Wholesale prices of all commodities <sup>4</sup>	Prices paid by farmers for commodities used in \$—			Farm wages	
					Living	Production	Living and production		
1925.....	91	98	101	151	164	147	157	176	270
1926.....	96	102	102	146	162	146	155	179	271
1927.....	95	100	100	139	159	145	153	179	277
1928.....	99	100	99	141	160	148	155	179	279
1929.....	110	107	99	139	158	147	153	180	281
1930.....	91	88	96	126	148	140	145	167	277
1931.....	75	67	88	107	126	122	124	130	253
1932.....	58	46	79	95	108	107	107	96	219
1933.....	69	48	76	96	109	108	109	85	187
1934.....	75	61	78	109	122	125	123	95	173
1935.....	87	69	80	117	124	126	125	103	180
1936.....	103	80	81	118	122	126	124	111	182
1937.....	113	94	84	126	128	135	130	126	187
1938.....	88	73	82	115	122	124	122	124	186
1939.....	108	83	82	113	120	122	121	124	190
1939—October.....	121	91	82	116	.....	.....	122	126	.....
.....November.....	124	93	82	116	.....	.....	122	.....	.....
.....December.....	126	93	82	116	121	124	122	.....	.....
1940—January.....	122	93	82	116	.....	.....	122	119	.....
.....February.....	116	89	82	115	.....	.....	122	.....	.....
.....March.....	112	87	82	114	121	125	123	.....	.....
.....April.....	111	86	82	115	.....	.....	123	124	.....
.....May.....	114	87	82	114	.....	.....	123	.....	.....
.....June.....	121	89	82	113	121	125	123	.....	.....
.....July.....	121	91	82	113	.....	.....	122	129	.....
.....August.....	121	94	82	113	.....	.....	122	.....	.....
.....September.....	125	97	82	114	.....	.....	122	.....	.....
.....October <sup>7</sup> .....	.....	.....	.....	114	.....	.....	122	129	.....

Year and month	Index of prices received by farmers (August 1909-July 1914=100)							Ratio of prices received to prices paid
	Grains	Cotton and cotton-seed	Fruits	Truck crops	Meat animals	Dairy products	Chickens and eggs	
1925.....	157	177	172	153	140	153	163	99
1926.....	131	122	138	143	147	152	159	94
1927.....	128	128	144	121	140	155	144	91
1928.....	130	152	176	159	151	158	153	96
1929.....	120	144	141	149	156	157	162	95
1930.....	100	102	162	140	133	137	129	87
1931.....	63	63	98	117	92	108	100	70
1932.....	44	47	82	102	63	83	82	61
1933.....	62	64	74	105	60	82	75	64
1934.....	93	99	100	103	68	95	89	73
1935.....	103	101	91	125	118	108	117	86
1936.....	108	100	100	111	121	119	115	92
1937.....	126	95	122	123	132	124	111	93
1938.....	74	70	73	101	114	109	108	78
1939.....	72	73	77	105	110	104	94	77
1939—October.....	77	74	73	128	112	112	108	80
.....November.....	79	75	66	123	107	117	117	80
.....December.....	87	82	65	96	101	118	97	79
1940—January.....	90	85	66	117	103	119	91	81
.....February.....	91	85	76	168	101	118	98	83
.....March.....	92	85	73	128	102	114	83	79
.....April.....	96	85	81	145	104	110	82	80
.....May.....	92	83	88	133	108	106	84	80
.....June.....	83	81	104	134	102	104	81	77
.....July.....	78	80	89	98	110	105	88	78
.....August.....	76	77	79	112	110	109	90	79
.....September.....	77	76	73	118	114	111	104	80
.....October.....	80	78	79	99	112	116	112	81

<sup>1</sup> Federal Reserve Board, adjusted for seasonal variation. Revised August 1940.

<sup>2</sup> Adjusted for seasonal variation.

<sup>3</sup> Monthly indexes for months not reported by the Bureau of Labor Statistics are interpolated by use of the National Industrial Conference Board cost-of-living reports.

<sup>4</sup> Bureau of Labor Statistics index with 1926=100, divided by its 1910-14 average of 68.5.

<sup>5</sup> These indexes are based on retail prices paid by farmers for commodities used in living and production reported quarterly for March, June, September, and December. The indexes for other months are interpolations between the successive quarterly indexes.

<sup>6</sup> Index of farm real estate taxes per acre. Base period represents taxes levied in the calendar years 1909-13, payable mostly within the period Aug. 1, 1909-July 31, 1914.

<sup>7</sup> Preliminary.

NOTE.—The index numbers of industrial production and of industrial workers' income shown above are not comparable in several respects. The base periods are different. The production index includes only mining and manufacturing; the income index also includes transportation. The production index is based on volume only, whereas the income index is affected by wage rates as well as by time worked. There is usually a time lag between changes in volume of production and in workers' income, since output can be increased or decreased to some extent without much change in the number of workers.